

## CLAIMS

What is claimed is:

1. A method of characterizing the loss for a digital traffic source as a function of the buffer size  $B$  for a given transmission rate  $\rho$ , comprising:

5 *Fig 1* feeding an actual or simulated first traffic source into a peak-rate shaper and producing a new time sequence for the bit-stream of the traffic source;

*Fig 2* feeding said first traffic source from the output of the peak-rate shaper,  $a(r,t)$ , into a server with deterministic rate  $\rho$  in the range  $[0,r]$  where  $r$  is the peak rate of the shaper;

10 observing the dynamics of queue size  $Q_{B,\rho}(r,t)$ ; and

recording points of loss wherein the maximum queue size  $Q_{B,\rho}(r,t)$  exceeds the buffer size  $B$  which corresponds to the loss of the traffic source for rate  $\rho$ .

2. A method as recited in claim 1, further comprising plotting of loss points  
15 for various buffer sizes  $B$  to create a loss curve for the traffic source.

3. A method as recited in claim 1, wherein the traffic source comprises a data stream selected from the group of data streams consisting of multimedia data streams, elementary video streams, and MPEG-2 transport streams.

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4. A method for determining the loss rate of a traffic source, comprising:  
transmitting the frames of an actual or simulated traffic source into a peak-rate shaper and producing a new time sequence for the bit-stream of the input traffic source;  
collecting the bit-stream at the output of the peak-rate shaper  $a(r, t)$  into a leaky-  
5 bucket shaper, said traffic source at said output having a transmission rate  $\rho$  and a  
buffer of size  $B$ ;  
recording busy periods of the traffic source at rate  $\rho$  received in buffer of size  $B$ ;  
recording buffer points at which loss occurs for each busy period recorded; and  
determining the maximum loss for buffer size  $B$  at rate  $\rho$ .

10 5. A method as recited in claim 4, further comprising plotting a loss rate  
curve for a desired range of buffer sizes  $B$  of interest by executing additional iterations  
to determine maximum loss rate across the range of buffer sizes.

15 6. A method of determining loss rate for a traffic source at a given rate  $\rho$   
received in a buffer of size  $B$ , comprising:  
transmitting the frames of an actual or simulated traffic source into a peak-rate  
shaper and producing a new time sequence for the bit-stream of the input traffic source;  
collecting the bit-stream at the output of the peak-rate shaper  $a(r, t)$  into a leaky-  
20 bucket shaper, said traffic source at said output having a transmission rate  $\rho$  and a  
buffer of size  $B$ ;

determining the set of active periods and associated queue lengths for the frames of the traffic source at rate  $\rho$ ;

determining busy periods for rate  $\rho$  and buffer size  $B$ ; and

iteratively examining the busy periods to determine points of loss and busy period

5 breaks for the given buffer size  $B$ ; and

outputting maximum detected loss rate.